Responding To Change…

THE U.S./GERMAN ENVIRONMENTAL TECHNOLOGY EXCHANGE AGREEMENT

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Introduction

The world has changed during the past 18 months. Despite the challenges created by the tragic events of September 11, 2001, and the world's response to the threat of international terrorism, stewardship of the environment continues to be a vital component of the Army's mission in the United States as well as in Germany. Indeed, in light of the increased threats of biological, chemical, and nuclear weapons as well as threats to civilian and military infrastructures (e.g., those supporting water and energy resources), addressing the common environmental challenges to the military missions of both countries has taken on new significance.

The Mutual Weapons Development Master Data Exchange Agreement (DEA) between the United States and Germany provides the framework for both countries to exchange data on environmental research and technology. The research and technology areas of interest are defined in four individual annexes: *DEA Annex 1311—Hazardous Materials, Material Substitutes and Air* (dealing with pollution prevention, waste minimization, material substitutes/recovery, and recycling); *DEA Annex 1520—Soil Contamination and Remediation*; *DEA Annex 1521—Water Contamination and Remediation*; and *DEA Annex 1522—Demilitarization and Disposal of Conventional Munitions*.

The executive agent (DEA general officer) for this DOD program is the U.S. Deputy Assistant Secretary of the Army for Environment, Safety and Occupational Health. The German DEA general officer is the Executive Director of the Federal Office of Defense Technology and Procurement (Bundesamt für Wehrtechnik und Beschaffung (BWB)). U.S. and German deputy general officers and assistant project officers (APOs) coordinate and oversee the activities undertaken through the environmental annexes. U.S. and German technical project officers (TPOs) and associate technical project officers (ATPOs) for each environmental annex are the technical leads and report through the APOs.

Technical planning meetings (TPMs) are scheduled biannually to exchange technical project results, evaluate progress toward goals, coordinate future goals, and foster relationships. The most recent TPM took place in Germany in October 2002, and the next is scheduled for early summer 2003 in the United States. Additionally, general meetings are held every 18 months, the most recent in June 2001 in Arlington, VA.

Meeting Challenges

World events have taken a toll on our endeavors, including international efforts that benefit the military missions of both the United States and Germany. In the midst of these challenges, environmental stewardship must continue to support mission readiness by complying with environmental laws, maintaining the availability of training lands, cleaning up and preventing pollution, improving soldier/family quality of life, and strengthening community relationships. Compliance and restoration continue to be vital components of the Army's environmental program. Continued investments in pollution prevention and conservation offer opportunities to reduce long-term operating costs and liabilities.

Responding To Change

There have also been many recent changes in the German and U.S. militaries requiring adjustment and flexibility to successfully proceed with DEA efforts. The German Ministry of Defense (MOD) and BWB

Figure 1.
The bench-scale test system used to show electrical migration with an ionic dye.

Figure 2.
DEA participants view the EK demonstration site at the NATO training range near Bergen, Germany.

continue to implement fundamental restructuring of their organizations. Environmental protection is a component of the BWB's capabilities and is incorporated into its acquisition process. There have also been changes in both the German and U.S. DEA leadership, which includes U.S. Air Force, U.S. Navy, and U.S. Army participation. To respond to these changes, members of the U.S. and German DEA leadership met in a June 2002 executive session to reinvigorate, guide, and direct technical officers for the TPM held in October 2002.

Moving Forward

The DEA leadership at the June 2002 executive session stressed the importance of focusing on the future. In planning for the October 2002 TPM, U.S. and German TPOs were directed to focus on current needs and to establish a requirements-driven agenda for their activities under each of the environmental annexes (that is, to identify real-world, environmental problems that must be resolved). They were also encouraged to maximize ongoing technology development as well as to use off-the-shelf technologies. Additionally, they were tasked with identifying and developing projects that will match needs, expertise, and resources across borders. The intent is to maximize benefits and achieve cost-effective investments.

Demonstrating Success

Heavy-metals contamination is a problem at U.S. military ranges and at German sites. As part of the October 2002 TPM, participants visited the site of an ongoing DEA technology demonstration project using electrokinetic (EK) treatment of metals-contaminated soils. Initiated and conducted under the auspices of *DEA Annex 1520*, this German MOD-funded project is being successfully implemented at a NATO training range in Bergen, Germany. Technical expertise and review have been provided by the U.S. Army Engineer Research and Development Center in Vicksburg, MS.

A bench-scale test cell was used to demonstrate how the EK process works. Clean sand was placed in a test cell with positive and negative electrodes on each side of the test cell. An ionic dye was placed in the negative side of the cell and electrical power was turned on. The ionic dye migrated through the sand toward the positive electrode by the electricity alone (Figure 1). After the bench-scale test demonstration, participants went to the treatment site. Soil containing cadmium and chromium from the training area is placed in pools where the contaminants are removed by electromigration. Figure 2 shows participants viewing one of the treatment pools where alternating lines of positive and negative electrodes extend into the contaminated soil.

Establishing a proven methodology with reproducible results for future technology demonstration projects is a key goal of the DEA. Lessons learned to date from the EK project are crucial to achieving this goal. These lessons were discussed at the TPM and will be applied by the DEA annex technical planning officers to the demonstration of other

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transferable technologies. A final report on the results of this EK demonstration project is expected by the next general meeting of the DEA, tentatively scheduled for fall 2003 in Germany.

Building On Success

The EK demonstration project clearly demonstrates the effectiveness of hands-on sharing of expertise and resources to achieve a common purpose: solving a real-world, environmental problem associated with military operations. While EK technology has been employed in the United States for a number of years, the refinement of the technology through this DEA-sponsored demonstration project could result in improved environmental cleanup strategies both in the United States and abroad.

There are many common challenges associated with environmental stewardship for both the U.S. and German military missions. These challenges have created the potential to achieve significant cost savings from jointly demonstrated and validated technologies. This demonstration and validation approach is especially valuable in the current climate of close regulatory scrutiny and increased demands on shrinking technical and budgetary resources.

Work is proceeding in each of the DEA annexes to identify specific problems and projects for joint demonstration. Once these have been identified and prioritized, experts and resources will be brought together to identify locations for possible remediation and technologies for demonstration. Once agreement is reached on these items, it is important to identify the mutual technical criteria that the demonstrated technologies must meet to achieve acceptance. Industrial, academic, and other potential sources of expertise for the demonstration and validation process will be identified.

A great deal of communication, coordination, and cooperation between the proponents and technical experts on both sides of the Atlantic is required. This will maximize the benefit and value of technology demonstration projects for both countries under the DEA. To that end, there is increased use of the Defense Environmental Network and Information eXchange (DENIX) to facilitate and enhance the exchange of information between U.S. and German DEA executive officers, TPOs, ATPOs, and approved outside experts who are permitted site access.

Conclusion

Over the years, the U.S.-German DEA for environmental technology has provided the opportunity to increase knowledge through the sharing of information and expertise. The DEA has also helped build strong professional relationships between environmental technical experts and those responsible for meeting 21st century environmental challenges. The U.S. and German military establishments share common goals of reducing environmentally related operating costs, fielding systems with minimal or no adverse environmental impacts, and balancing available resources against validated needs to achieve cost-effective investments. Activities conducted under the DEA will continue to enable the harnessing of each country's technical capabilities and to capitalize on their respective strengths to maximize environmental benefits and maintain mission readiness.

Additional information on the specific focus areas for each of the DEA environmental technology annexes is available from the U.S. TPO for each annex. Go to the DENIX Web site, **www.denix.osd.mil/** (type **DEA** in the Search box), or contact Plexus Scientific Corp. at (703) 845-8492.

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